PHOTO E 7.1-1
POWER AND COMMUNICATIONS FEEDER PATH BEHIND CABINET 1

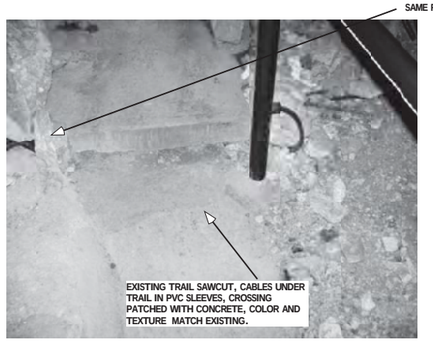

PHOTO E 7.1-2A
POWER AND COMMUNICATIONS FEEDER CROSSING THE EXISTING TRAIL

PHOTO E 7.1-2B
POWER AND COMMUNICATIONS FEEDER CROSSING THE EXISTING TRAIL

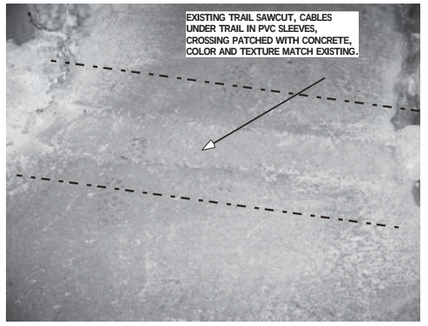

PHOTO E 7.1-3
POWER AND COMMUNICATIONS FEEDER CROSSING THE EXISTING TRAIL BETWEEN STAIR 45 AND STAIR 49

PHOTO E 7.1-4
POWER AND COMMUNICATIONS FEEDER EXITING THE PARADISE ROOM

AFTER CROSSING THE TRAIL, FURNISH AND INSTALL THE NEW POWER FEEDER ADJACENT TO THE EXISTING COMMUNICATION FEEDER ON THE SURFACE OF THE CAVE FLOOR IN A CREVICE UNTIL THEY JOIN THE EXISTING OLD POWER FEEDER HERE AND THENCE FOLLOW AN ACCESSIBLE TUNNEL (WHICH IS SOME DISTANCE FROM THE MAIN TRAIL).

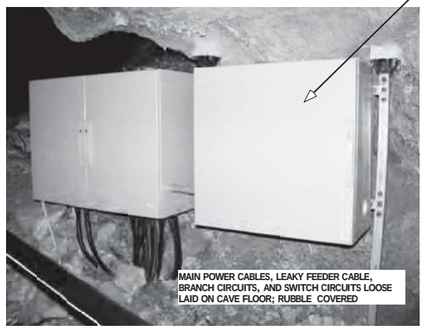

PHOTO E 7.1-5A
CABINET 1

PHOTO E 7.1-5B
UPS AND BATTERY BANK, CABINET 1

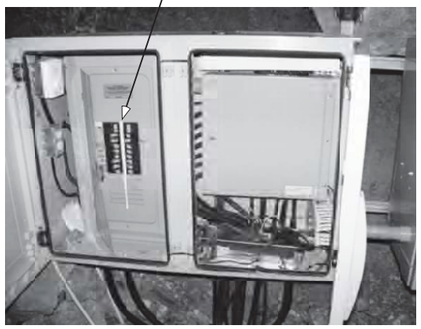

PHOTO E 7.1-5C
PANEL 'B' AND LIGHTING CONTROL PANEL CABINET 1

PHOTO E 7.1-D
LEAKY FEEDER CABLE AND GFI RECEPTACLE, EAST END OFCABINET 1

PHOTO E 7.1-5E
UNISTRUT MOUNTING OF CABINET 1

PHOTO E 7.1-6A
EXIT TUNNEL INSTALLED LIGHTING - GENERAL VIEWS

PHOTO E 7.1-6B
EXIT TUNNEL INSTALLED LIGHTING - GENERAL VIEWS

PHOTO E 7.1-6C
EXIT TUNNEL INSTALLED LIGHTING - GENERAL VIEWS

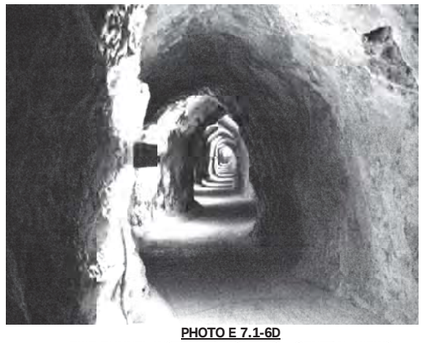

PHOTO E 7.1-6D
EXIT TUNNEL INSTALLED LIGHTING - GENERAL VIEWS

PHOTO E 7.1-6E
EXIT TUNNEL LOCATION - GENERAL VIEWS

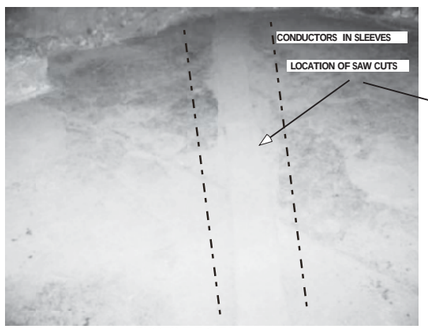

PHOTO E 7.1-7A
AREA OF FLOOR VICINITY TOP OF STAIR 49
SAWCUTS PATCHED TO MATCH

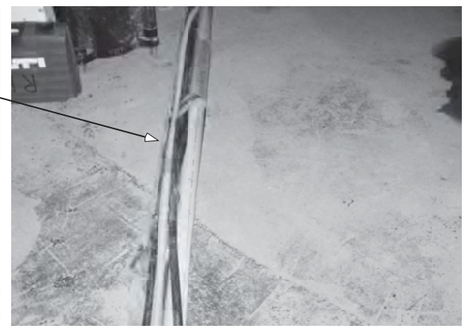

PHOTO E 7.1-7B
AREA OF FLOOR VICINITY TOP OF STAIR 49
SAWCUTS BEFORE PATCH

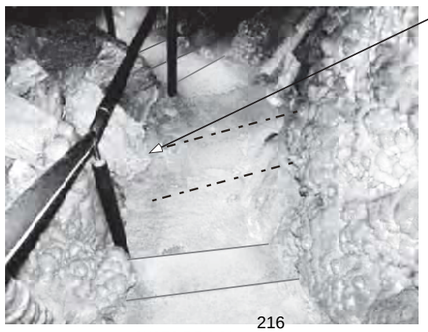

PHOTO E 7.1-8A
SAWCUT TRAIL CROSSING BETWEEN STAIR 45 AND 46

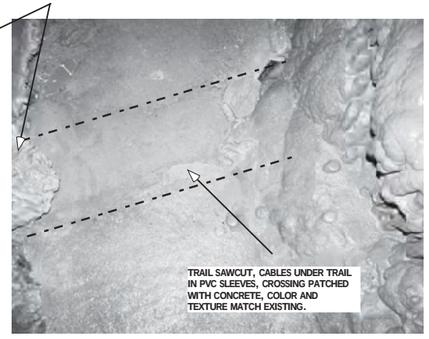

PHOTO E 7.1-8B
SAWCUT TRAIL CROSSING BETWEEN STAIR 45 AND 46

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E 7.1

LIGHT FIXTURE(S) THIS SHEET

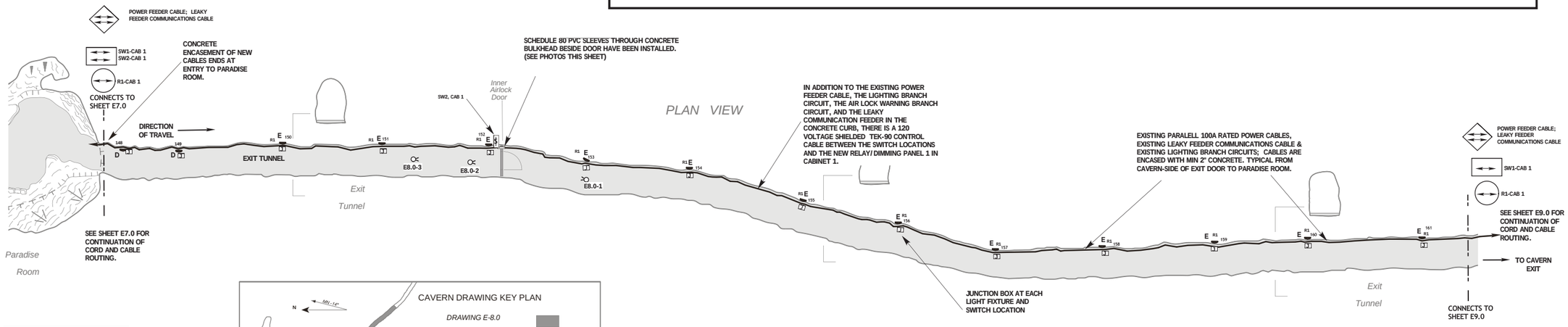
FIXTURE 'E' IS A COLE LIGHTING 13 WATT LED FANNY PACK

SWITCH MOUNTING NOTES FOR THIS SHEET

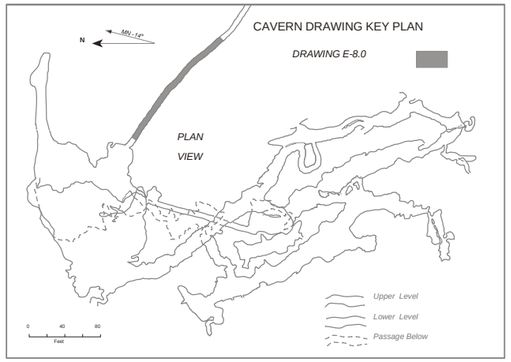
1. SWITCH SW2-CAB 1 IS SECURED TO THE EXISTING CAVERN TUNNEL WALL AND IS MOUNTED AT 42 INCHES ABOVE TRAIL.

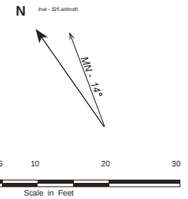
THIS SHEET SHOWS THE TUNNEL EXIT DISTANCE FOR CONTRACTOR REFERENCE WHEN MOVING MATERIAL FROM OUTSIDE TO THE INSIDE OF THE CAVERN.

(NO CONTRACTOR WORK REQUIRED IN PHASE 2 ON THIS SHEET) THE DETAILS ON THIS SHEET ARE APPLICABLE TO PHASE 2 WORK.



CABINET #1 THIS SHEET	
R1-CAB 1	TUNNEL LIGHTS AND AIRLOCK OCCUPANCY LIGHTS





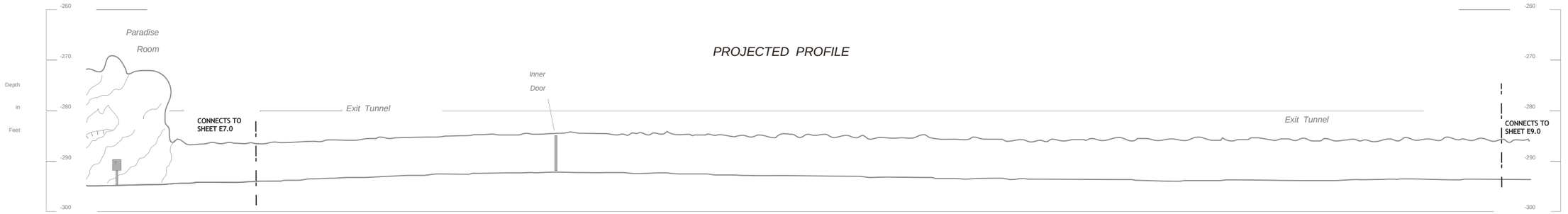


PHOTO E 8.0-1
OUTSIDE FACE OF INNER AIRLOCK DOOR

SWITCH 2 CABINET 1

CONCRETE ENCASED POWER CABLE, LEAKY FEEDER COMMUNICATIONS CABLE, BRANCH CIRCUITS, AND CONTROL CABLES.

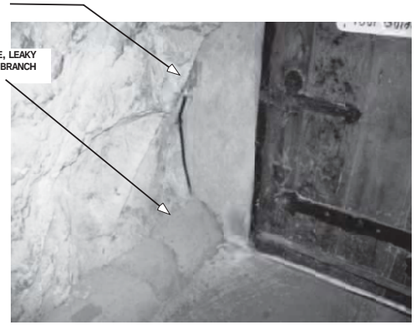
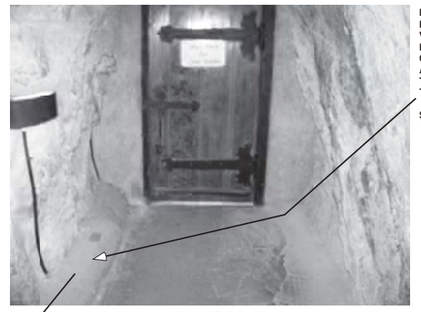


PHOTO E 8.0-2A
INSIDE FACE OF INNER AIRLOCK DOOR

SWITCH 2 CABINET 1

PHOTO E 8.0-2B
INSIDE FACE OF INNER AIRLOCK DOOR



EXISTING CAVERN POWER FEEDER RATED 200 AMPS AMPACITY (FOR VOLTAGE DROP) AND THE EXISTING LEAKY FEEDER COMMUNICATIONS CABLE PLUS TWO BRANCH CIRCUITS AND A CONTROL CIRCUIT. SECURED TO TUNNEL WALL WITH CABLE CLAMPS, THEN ENCASED IN CONCRETE,

SEE SHEET E9.0 FOR DETAILS.

PHOTO E 8.0-3
EXIT TUNNEL AT INTERIOR (CAVERN SIDE) OF AIRLOCK

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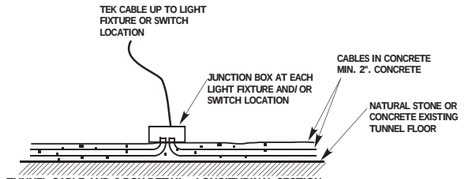
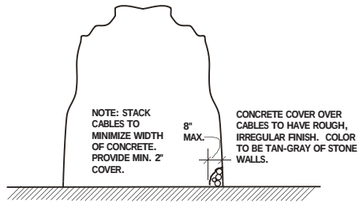
LIGHT FIXTURE(S) THIS SHEET

FIXTURE 'E' IS A COLE LIGHTING 13 WATT LED FANNY PACK
FIXTURE 'X1' IS AN EXISTING INCANDESCENT FIXTURE FOR AIR LOCK CONTROL



TUNNEL CABLE AND J-BOX DETAIL - LONGITUDINAL SECTION

NOT TO SCALE



EXIT TUNNEL CONDUIT DETAIL--CROSS SECTION

NOT TO SCALE

SWITCH MOUNTING NOTES FOR THIS SHEET

1. SWITCH SW1-CAB 1 SECURED TO THE EXISTING CAVERN DOOR BULKHEAD.

POWER FEEDER CABLE; LEAKY FEEDER COMMUNICATIONS CABLE

SW1-CAB 1

R1-CAB 1

CONNECTS TO SHEET E8.0

SEE SHEET E8.0 FOR CONTINUATION OF CORD AND CABLE ROUTING.

DIRECTION OF TRAVEL

JUNCTION BOX LOCATED AT EACH LIGHT FIXTURE AND SWITCH LOCATION, SEE DETAIL ABOVE.

PLAN VIEW

Exit Tunnel

THE EXISTING POWER CABLE, THE EXISTING LIGHTING BRANCH CIRCUIT, AND THE EXISTING LEAKY COMMUNICATION FEEDER ARE LOCATED IN THE CONCRETE CURB, THERE IS A 120 VOLTAGE 16/ 4 TEK-90 CONTROL CABLE BETWEEN THE SWITCH LOCATION AND THE NEW RELAY PANEL 1 IN CABINET 1.

EXISTING SINGLE 200A FEEDER, LEAKY FEEDER COMMUNICATIONS CABLE & LIGHTING BRANCH CIRCUIT CABLES ON EXISTING FLOOR OF ENTRY TUNNEL. ENCASED IN CONCRETE.

NOTE: CONDUITS ARE LOCATED UNDER DOOR AND UP TO FLOOR LEVEL OF CAVERN-SIDE OF EXIT DOOR.

CONCRETE FLOOR

E9.1-3

SW1-CAB1

X1

E9.1-5

ASPHALT FLOOR

Exit Door

END R1,R2

Concrete Lining on tunnel

NEW WP SWITCH, SW1-CAB1. THIS SWITCH CONTROLS THE AIR LOCK ACCESS INDICATING CONTROL AND THE EXIT TUNNEL LIGHTS VIA RELAY CONTROL.

THE RELAY CONTROL IS LOCATED IN THE RELAY PANEL IN CABINET 1.

RED LIGHT AIR LOCK INDICATING BRANCH CIRCUIT R1 CONNECTED TO NEW LIGHT FIXTURE 'X1' AT THIS LOCATION. SEE PHOTOS ON SHEET E 9.1

EXISTING POWER CABLE AND LEAKY FEEDER COMMUNICATIONS CABLE ARE INSTALLED IN SCHEDULE 40 CONDUITS, ONE EACH.

TRENCH IN APPROXIMATE CENTER OF PATHWAY. PATCHED WITH COLD-MIX ASPHALT, COMPACTED.

Return Trail to Visitor Center

E9.1.6
E9.1.4

CAVERN EXIT

Exit Tunnel

E9.1-2

Elevation: 5318 ft.
GPS: 45.83658N, 111.87642W

EXISTING POWER FEEDER CABLE AND LEAKY FEEDER COMMUNICATIONS CABLE UG THRU SCHEDULE 40 CONDUIT TO TUNNEL ENTRANCE.

POWER CABLE IS PARALLEL 100A CONDUCTORS FROM THE SERVICE ENTRANCE TO PANEL B IN CABINET 1.

SERVICE ENTRANCE:
NEW STRUCTURE WITH NEW PANEL 'A' & RADIO COMMUNICATION EQUIPMENT AT THIS LOCATION, ON SLAB.

EXISTING PRE-PHASE 1 SERVICE CABLING ALSO SUPPLIED FROM THE NEW MAIN PANEL.

NEW POWER CABLE AND LEAKY FEEDER COMMUNICATIONS CABLE TO EXIT TUNNEL.

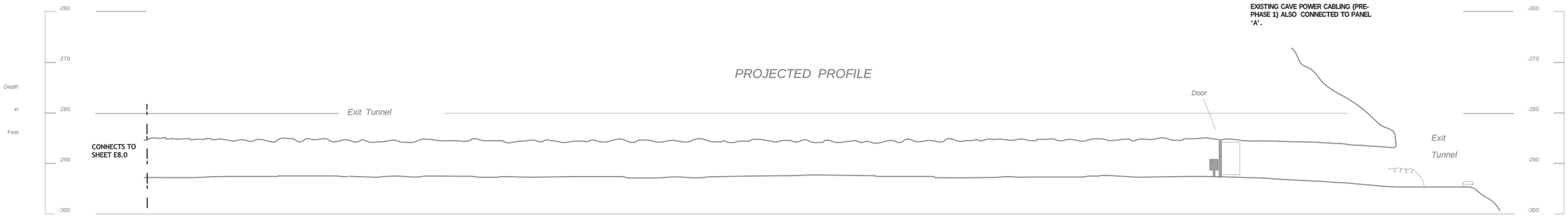
EXISTING CAVE POWER CABLING (PRE-PHASE 1) ALSO CONNECTED TO PANEL 'A'.

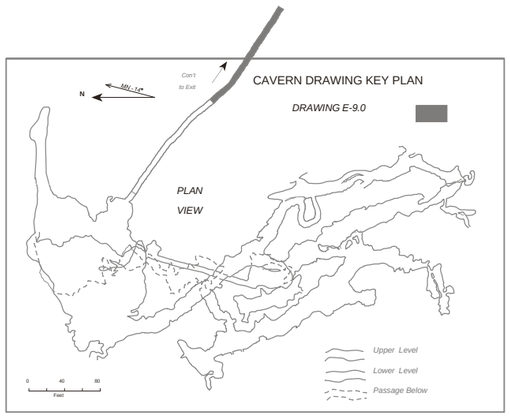
SLAB
COMMUNICATIONS CABINET
PANEL 'A'
METER
E9.1-1

CABINET #1 THIS SHEET	
R1-CAB 1	TUNNEL LIGHTS AND AIRLOCK OCCUPANCY LIGHTS

THIS SHEET SHOWS THE TUNNEL EXIT DISTANCE FOR CONTRACTOR REFERENCE WHEN MOVING MATERIAL FROM OUTSIDE TO THE INSIDE OF THE CAVERN.

(NO CONTRACTOR WORK REQUIRED IN PHASE 2 ON THIS SHEET) THE DETAILS ON THIS SHEET ARE APPLICABLE TO PHASE 2 WORK.





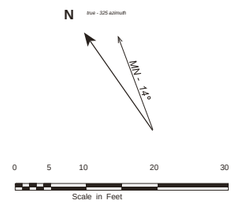


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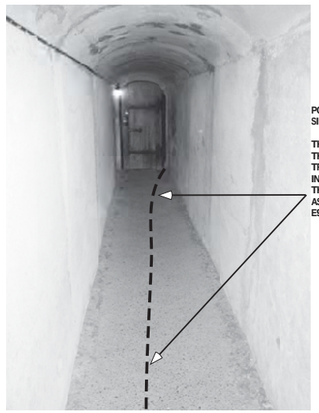
PHOTO E 9.1-1
SERVICE ENTRANCE STRUCTURE

A NEW METER WAS INSTALLED, AND A NEW 100 AMP LOAD CENTER WAS INSTALLED TO SUPPLY THE LOCAL COMMUNICATIONS ENCLOSURE, THE NEW 100 AMP FEEDER (200 AMP AMPACITY) AND THE EXISTING 100 MAIN PRE-PHASE 1 POWER CABLING.

THE NEW LOAD CENTER PANEL 'A' SUPPLIES BOTH THE EXISTING CAVE POWER CABLING (PRE PHASE 1) FROM BOTH THE TOP AND BOTTOM AND THE NEW CAVERN POWER CABLE FROM THE BOTTOM.

(AS INDICATED ON THE ONE LINE DIAGRAM, IN PHASE 2 THE EXISTING PRE PHASE 1 LOWER FEEDER CABLE IS REMOVED FROM EXISTING PANEL 'A' AND TAGGED FOR FUTURE REFERENCE.)

THE CONTRACTOR FURNISHED AND INSTALLED THE NEW CAVERN POWER FEEDER RATED 200 AMPS AMPACITY (FOR VOLTAGE DROP) AND THE NEW LEAKY FEEDER COMMUNICATIONS CONDUCTOR UNDER THE FLOOR IN SCHEDULE 40 PVC CONDUIT.



POWER FEEDER HERE IS A SINGLE CABLE ASSEMBLY.

THE FLOOR IS ASPHALT. THE CONTRACTOR TRENCHED THE FLOOR, INSTALLED NEW CABLES; THEN RESTORED THE FLOOR AS DESCRIBED ON SHEET E9.0.

PHOTO E 9.1-2A
EXIT TUNNEL AT EXIT (OUTSIDE)

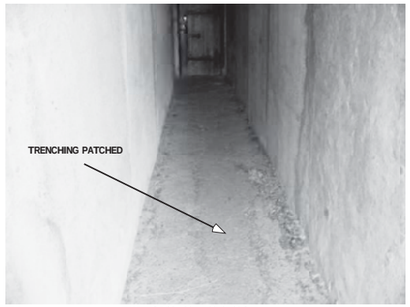


PHOTO E 9.1-2B
EXIT TUNNEL AT EXIT (LOOKING IN)

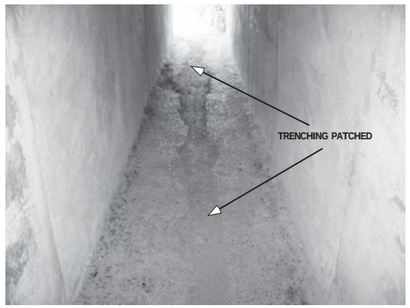


PHOTO E 9.1-2C
EXIT TUNNEL AT EXIT (LOOKING OUT)

NEW LIGHT FIXTURE, REUSING THE EXISTING JUNCTION BOX AND WALL PENETRATION TO CONNECT TO THE EXISTING WARNING LIGHT ON THE OUTSIDE SURFACE OF THIS WALL, DIRECTLY OPPOSITE. (SEE PHOTO E-9.1-5, THIS SHEET.)

EXISTING SWITCHES

EXISTING CABINET WITH EXISTING PANEL INSIDE

PHOTO E 9.1-3
EXIT TUNNEL AT EXIT (CAVERN SIDE)

NOTE THE LARGE PATH WITH SUFFICIENT CLEARANCE WITH A GOLF CART OR ATV TYPE VEHICLE.

PHOTO E 9.1-4
CAVE EXIT

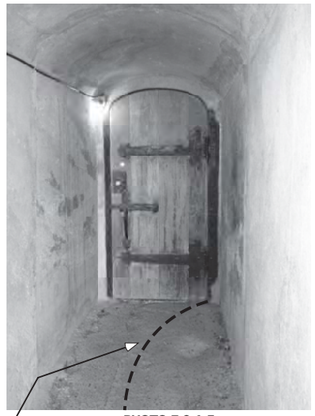


PHOTO E 9.1-5
EXISTING OUTSIDE AIR LOCK WARNING LIGHT

ROUTE OF CABLING UNDER THE FLOOR (POWER CABLE AND LEAKY FEEDER CABLE), FROM CORNER OF THE DOOR INTO CENTER OF PATHWAY.

VISITOR'S CENTER

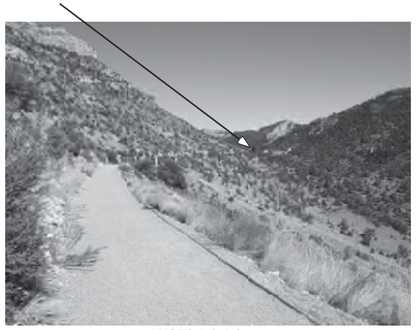


PHOTO E 9.1-6
EXISTING PATH TO CAVE VISITOR CENTER

PHOTOS E 9.1-7
TWO VIEWS OF POTENTIAL STORAGE AREA AT CAVERN ENTRANCE FOR PHASE 2 WORK

PARK MANAGER AND PARK STAFF

NOTE PAVED TRAIL WITH MODERATE GRADES

NOTE STEPS WHICH MUST BE PROTECTED

PHOTOS E 9.1-8A
TWO VIEWS OF THE UPPER TRAIL WHICH CAN BE USED FOR PHASE 2 WORK.

NOTE A COUPLE OF SWITCH BACKS JUST BELOW STEPS

NOTE A COUPLE OF SWITCH BACKS JUST ABOVE CAVE VISITOR CENTER

BETWEEN THESE TWO SWITCH BACKS THERE IS PLAIN, PAVED TRAIL OF ABOUT THE SAME WIDTH.

PHOTOS E 9.1-8B
TWO VIEWS OF THE UPPER TRAIL WHICH CAN BE USED FOR PHASE 2 WORK.

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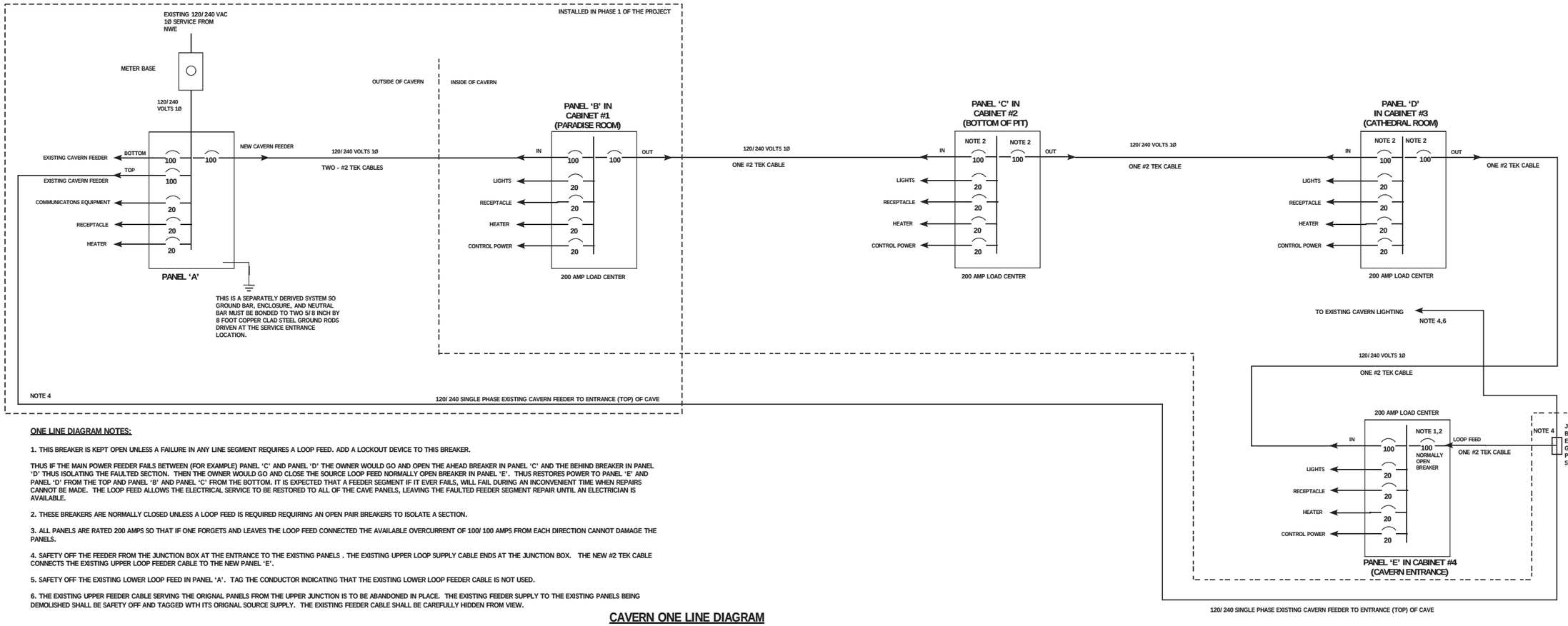


ONE LINE DIAGRAM NOTES:

1. THIS BREAKER IS KEPT OPEN UNLESS A FAILURE IN ANY LINE SEGMENT REQUIRES A LOOP FEED. ADD A LOCKOUT DEVICE TO THIS BREAKER.

THUS IF THE MAIN POWER FEEDER FAILS BETWEEN (FOR EXAMPLE) PANEL 'C' AND PANEL 'D' THE OWNER WOULD GO AND OPEN THE AHEAD BREAKER IN PANEL 'C' AND THE BEHIND BREAKER IN PANEL 'D' THUS ISOLATING THE FAULTED SECTION. THEN THE OWNER WOULD GO AND CLOSE THE SOURCE LOOP FEED NORMALLY OPEN BREAKER IN PANEL 'E'. THUS RESTORES POWER TO PANEL 'E' AND PANEL 'D' FROM THE TOP AND PANEL 'B' AND PANEL 'C' FROM THE BOTTOM. IT IS EXPECTED THAT A FEEDER SEGMENT IF IT EVER FAILS, WILL FAIL DURING AN INCONVENIENT TIME WHEN REPAIRS CANNOT BE MADE. THE LOOP FEED ALLOWS THE ELECTRICAL SERVICE TO BE RESTORED TO ALL OF THE CAVE PANELS, LEAVING THE FAULTED FEEDER SEGMENT REPAIR UNTIL AN ELECTRICIAN IS AVAILABLE.

2. THESE BREAKERS ARE NORMALLY CLOSED UNLESS A LOOP FEED IS REQUIRED REQUIRING AN OPEN PAIR BREAKERS TO ISOLATE A SECTION.

3. ALL PANELS ARE RATED 200 AMPS SO THAT IF ONE FORGETS AND LEAVES THE LOOP FEED CONNECTED THE AVAILABLE OVERCURRENT OF 100/ 100 AMPS FROM EACH DIRECTION CANNOT DAMAGE THE PANELS.

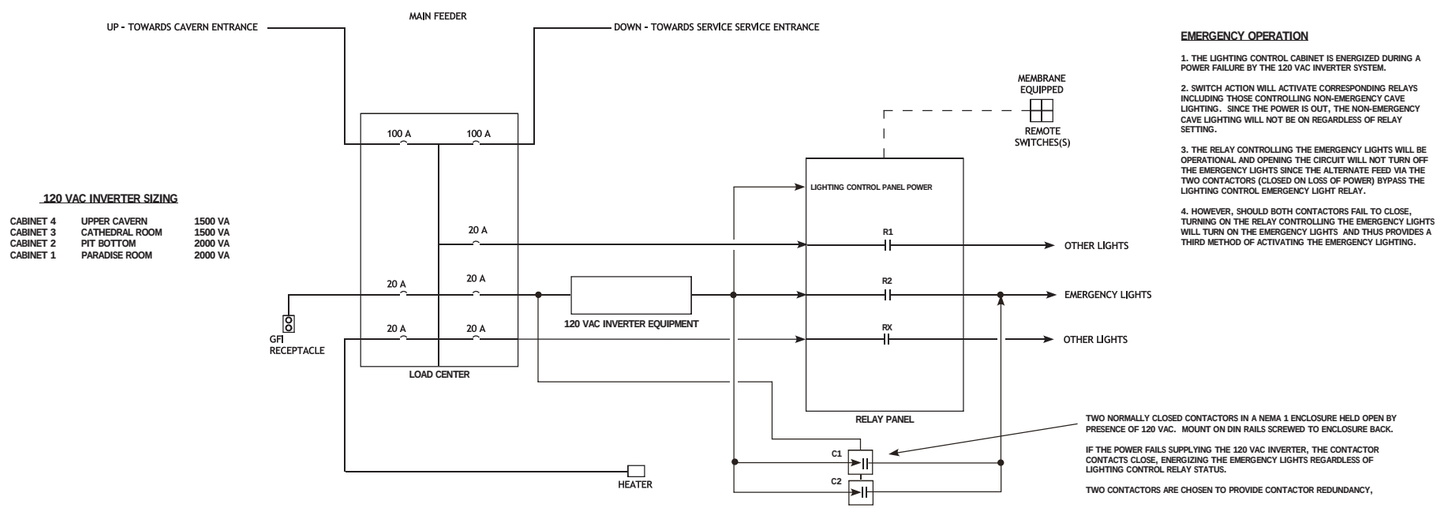
4. SAFETY OFF THE FEEDER FROM THE JUNCTION BOX AT THE ENTRANCE TO THE EXISTING PANELS . THE EXISTING UPPER LOOP SUPPLY CABLE ENDS AT THE JUNCTION BOX. THE NEW #2 TEK CABLE CONNECTS THE EXISTING UPPER LOOP FEEDER CABLE TO THE NEW PANEL 'E'.

5. SAFETY OFF THE EXISTING LOWER LOOP FEED IN PANEL 'A'. TAG THE CONDUCTOR INDICATING THAT THE EXISTING LOWER LOOP FEEDER CABLE IS NOT USED.

6. THE EXISTING UPPER FEEDER CABLE SERVING THE ORIGNAL PANELS FROM THE UPPER JUNCTION IS TO BE ABANDONED IN PLACE. THE EXISTING FEEDER SUPPLY TO THE EXISTING PANELS BEING DEMOLISHED SHALL BE SAFETY OFF AND TAGGED WTH ITS ORIGNAL SOURCE SUPPLY. THE EXISTING FEEDER CABLE SHALL BE CAREFULLY HIDDEN FROM VIEW.

CAVERN ONE LINE DIAGRAM

NOT TO SCALE



120 VAC INVERTER SIZING

CABINET 4	UPPER CAVERN	1500 VA
CABINET 3	CATHEDRAL ROOM	1500 VA
CABINET 2	PIT BOTTOM	2000 VA
CABINET 1	PARADISE ROOM	2000 VA

EMERGENCY OPERATION

1. THE LIGHTING CONTROL CABINET IS ENERGIZED DURING A POWER FAILURE BY THE 120 VAC INVERTER SYSTEM.

2. SWITCH ACTION WILL ACTIVATE CORRESPONDING RELAYS INCLUDING THOSE CONTROLLING NON-EMERGENCY CAVE LIGHTING. SINCE THE POWER IS OUT, THE NON-EMERGENCY CAVE LIGHTING WILL NOT BE ON REGARDLESS OF RELAY SETTING.

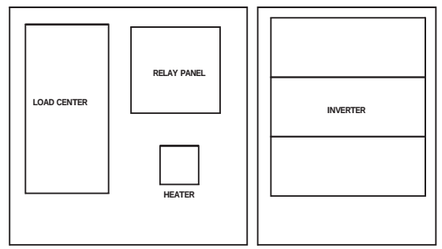
3. THE RELAY CONTROLLING THE EMERGENCY LIGHTS WILL BE OPERATIONAL AND OPENING THE CIRCUIT WILL NOT TURN OFF THE EMERGENCY LIGHTS SINCE THE ALTERNATE FEED VIA THE TWO CONTACTORS (CLOSED ON LOSS OF POWER) BYPASS THE LIGHTING CONTROL EMERGENCY LIGHT RELAY.

4. HOWEVER, SHOULD BOTH CONTACTORS FAIL TO CLOSE, TURNING ON THE RELAY CONTROLLING THE EMERGENCY LIGHTS WILL TURN ON THE EMERGENCY LIGHTS AND THUS PROVIDES A THIRD METHOD OF ACTIVATING THE EMERGENCY LIGHTING.

TWO NORMALLY CLOSED CONTACTORS IN A NEMA 1 ENCLOSURE HELD OPEN BY PRESENCE OF 120 VAC. MOUNT ON DIN RAILS SCREWED TO ENCLOSURE BACK.

IF THE POWER FAILS SUPPLYING THE 120 VAC INVERTER, THE CONTACTOR CONTACTS CLOSE, ENERGIZING THE EMERGENCY LIGHTS REGARDLESS OF LIGHTING CONTROL RELAY STATUS.

TWO CONTACTORS ARE CHOSEN TO PROVIDE CONTACTOR REDUNDANCY,



CABINET, TYPICAL CABINET 1-4

SCALE: 1 INCH = 1 FOOT AT ARCHITECTURAL D SIZE

0 6" 1.0' 2.0' 3.0'

CABINET ONE LINE DIAGRAM TYPICAL CABINET 1-4

NOT TO SCALE

Lewis & Clark Caverns State Park
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PANEL 'A' (MAIN SERVICE, OUTSIDE)

MAIN: 200 AMP MAIN BREAKER
BUS: 200 AMPS MINIMUM
SQUARE D OR GE LOAD CENTER OR EQUIVALENT

SLOT #	CKT.	SERVICE	AMPS	BRKR	WIRE	USE	PHS	USE	WIRE	BRKR	AMPS	SERVICE	CKT.	SLOT #
1	A1	EXISTING CAVERN FEEDER	100	THQ	EX	2H,N,G	1			THQ	20	SPARE (INSTALL BREAKER)	A2	2
3		EXISTING CAVERN FEEDER	100	THQ			2			THQ	20	SPARE (INSTALL BREAKER)	A4	4
5	A5	EXISTING CAVERN FEEDER	100	THQ	EX	2H,N,G	1			THQ	20	SPARE (INSTALL BREAKER)	A6	6
7		EXISTING CAVERN FEEDER	100	THQ			2							8
9	A9	NEW CAVERN FEEDER	100	THQ	#2 TEK CABLE	2H,N,G	1							10
11		NEW CAVERN FEEDER	100	THQ			2							12
13	A13	COMMUNICATIONS CABINET EQUIPMENT POWER	20	THQ	#12	H,N,G	1							14
15	A15	COMMUNICATIONS CABINET HTR-2	20	THQ	#12	H,N,G	2							16
17	A17	STRUCTURE RECEPTACLE	20	THQ	#12	H,N,G	1							18
19	A19	SPARE (INSTALL BREAKER)	20	THQ			2							20

NOTES:
1. 2H,N,G MEANS RUN TWO HOT, ONE NEUTRAL AND ONE GROUND CONDUCTOR
2. CONDUCTOR SIZING BASED ON COPPER THWN CONDUCTORS.
3. CONTRACTOR MAY SPLICE ON #2 COPPER TO THE 3/0 CABLE IN ORDER FOR CONDUCTOR TO FIT ON BREAKER A9

INSTALLED IN PHASE 1 OF THE PROJECT

PANEL 'E' (CABINET #4, CAVERN ENTRANCE)

MAIN: 200 AMP MAIN LUGS ONLY
BUS: 200 AMPS MINIMUM
SQUARE D OR GE LOAD CENTER OR EQUIVALENT

SLOT #	CKT.	SERVICE	AMPS	BRKR	WIRE	USE	PHS	USE	WIRE	BRKR	AMPS	SERVICE	CKT.	SLOT #
1	E1	CAVERN FEEDER FROM PANEL 'D'	100	THQ	#2 TEK CABLE	2H,N,G	1	2H,N,G	#2 TEK CABLE	THQ	100	NORMALLY OPEN BRKR FROM EXISTING FDR	E2	2
3		CAVERN FEEDER FROM PANEL 'D'	100	THQ			2			THQ	100	NORMALLY OPEN BRKR FROM EXISTING FDR		4
5	E5	EMERGENCY LIGHT INVERTER	30	THQ	#10 IN ENT	H,N,G	1			THQ	20	SPARE (INSTALL BREAKER)	E6	6
7	E7	RELAY PANEL CONTROL POWER	20	THQ	#12 IN ENT	H,N,G	2			THQ	20	SPARE (INSTALL BREAKER)	E8	8
9	E9	CABINET RECEPTACLE	20	THQ	#12 IN ENT	H,N,G	1			THQ	20	SPARE (INSTALL BREAKER)	E10	10
11	E11	CABINET HEATER HT1	20	THQ	#12 IN ENT	H,N,G	2			THQ	20	SPARE (INSTALL BREAKER)	E12	12
13	E13	EMERGENCY LIGHTING CIRCUIT R2 & R3	20	THQ	12/3 & 10/3 (R3) SOOW	H,N,G	1			THQ	20	SPARE (INSTALL BREAKER)	E14	14
15	E15	LIGHTING CIRCUIT R1	20	THQ	12/3 SOOW	H,N,G	2			THQ	20	SPARE (INSTALL BREAKER)	E16	16
17							1			THQ	20	SPARE (INSTALL BREAKER)	E18	18
19							2			THQ	20	SPARE (INSTALL BREAKER)	E20	20

NOTES:
1. 2H,N,G MEANS RUN TWO HOT, ONE NEUTRAL AND ONE GROUND CONDUCTOR
2. CONDUCTOR SIZING BASED ON COPPER THWN CONDUCTORS.
3. CONTRACTOR MAY USE ONLY ONE 100 AMP CABLE IN ORDER FOR CONDUCTOR TO FIT ON 100 AMP BREAKER

EXISTING PANEL 'B' (CABINET #1, PARADISE ROOM)

MAIN: 200 AMP MAIN LUGS ONLY
BUS: 200 AMPS MINIMUM
SQUARE D OR GE LOAD CENTER OR EQUIVALENT

SLOT #	CKT.	SERVICE	AMPS	BRKR	WIRE	USE	PHS	USE	WIRE	BRKR	AMPS	SERVICE	CKT.	SLOT #
1	B1	CAVERN FEEDER FROM PANEL 'A'	100	THQ	#2 TEK CABLE	2H,N,G	1	2H,N,G	#2 TEK CABLE	THQ	100	CAVERN FEEDER GOING TO PANEL 'C'	B2	2
3		CAVERN FEEDER FROM PANEL 'A'	100	THQ			2			THQ	100	CAVERN FEEDER GOING TO PANEL 'C'		4
5	B5	EMERGENCY LIGHT INVERTER	30	THQ	#10 IN ENT	H,N,G	1			THQ	20	SPARE (INSTALL BREAKER)	B6	6
7	B7	RELAY PANEL CONTROL POWER	20	THQ	#12 IN ENT	H,N,G	2			THQ	20	SPARE (INSTALL BREAKER)	B8	8
9	B9	CABINET RECEPTACLE	20	THQ	#12 IN ENT	H,N,G	1			THQ	20	SPARE (INSTALL BREAKER)	B10	10
11	B11	CABINET HEATER HT1	20	THQ	#12 IN ENT	H,N,G	2			THQ	20	SPARE (INSTALL BREAKER)	B12	12
13	B13	EMERGENCY LIGHTING CIRCUIT R1, R3, R5, R7, R9	20	THQ	12/3 & 10/3 (R7) SOOW	H,N,G	1			THQ	20	SPARE (INSTALL BREAKER)	B14	14
15	B15	LIGHTING CIRCUIT R2, R4	20	THQ	12/3 SOOW	H,N,G	2			THQ	20	SPARE (INSTALL BREAKER)	B16	16
17	B17	LIGHTING CIRCUIT R6	20	THQ	12/3 SOOW	H,N,G	1			THQ	20	SPARE (INSTALL BREAKER)	B18	18
19	B19	LIGHTING CIRCUIT R8	20	THQ	10/3 SOOW	H,N,G	2			THQ	20	SPARE (INSTALL BREAKER)	B20	20

NOTES:
1. 2H,N,G MEANS RUN TWO HOT, ONE NEUTRAL AND ONE GROUND CONDUCTOR
2. CONDUCTOR SIZING BASED ON COPPER THWN CONDUCTORS.
3. CONTRACTOR MAY USE ONLY ONE 100 AMP CABLE IN ORDER FOR CONDUCTOR TO FIT ON 100 AMP BREAKER

CIRCUIT B2 IS NEW WORK IN PHASE 2. SEE SHEET E7.0

INSTALLED IN PHASE 1 OF THE PROJECT

PANEL 'C' (CABINET #2, PIT BOTTOM)

MAIN: 200 AMP MAIN LUGS ONLY
BUS: 200 AMPS MINIMUM
SQUARE D OR GE LOAD CENTER OR EQUIVALENT

SLOT #	CKT.	SERVICE	AMPS	BRKR	WIRE	USE	PHS	USE	WIRE	BRKR	AMPS	SERVICE	CKT.	SLOT #
1	C1	CAVERN FEEDER FROM PANEL 'B'	100	THQ	#2 TEK CABLE	2H,N,G	1	2H,N,G	#2 TEK CABLE	THQ	100	CAVERN FEEDER GOING TO PANEL 'D'	C2	2
3		CAVERN FEEDER FROM PANEL 'B'	100	THQ			2			THQ	100	CAVERN FEEDER GOING TO PANEL 'D'		4
5	C5	EMERGENCY LIGHT INVERTER	30	THQ	#10 IN ENT	H,N,G	1			THQ	20	SPARE (INSTALL BREAKER)	C6	6
7	C7	RELAY PANEL CONTROL POWER	20	THQ	#12 IN ENT	H,N,G	2			THQ	20	SPARE (INSTALL BREAKER)	C8	8
9	C9	CABINET RECEPTACLE	20	THQ	#12 IN ENT	H,N,G	1			THQ	20	SPARE (INSTALL BREAKER)	C10	10
11	C11	CABINET HEATER HT1	20	THQ	#12 IN ENT	H,N,G	2			THQ	20	SPARE (INSTALL BREAKER)	C12	12
13	C13	EMERGENCY LIGHTING CIRCUIT R2 & R4	20	THQ	12/3 & 10/3 (R4) SOOW	H,N,G	1			THQ	20	SPARE (INSTALL BREAKER)	C14	14
15	C15	LIGHTING CIRCUIT R1	20	THQ	12/3 SOOW	H,N,G	2			THQ	20	SPARE (INSTALL BREAKER)	C16	16
17	C17	LIGHTING CIRCUIT R3	20	THQ	10/3 SOOW	H,N,G	1			THQ	20	SPARE (INSTALL BREAKER)	C18	18
19	C18	LIGHTING CIRCUIT R5	20	THQ	12/3 SOOW	H,N,G	2			THQ	20	SPARE (INSTALL BREAKER)	C20	20

NOTES:
1. 2H,N,G MEANS RUN TWO HOT, ONE NEUTRAL AND ONE GROUND CONDUCTOR
2. CONDUCTOR SIZING BASED ON COPPER THWN CONDUCTORS.
3. CONTRACTOR MAY USE ONLY ONE 100 AMP CABLE IN ORDER FOR CONDUCTOR TO FIT ON 100 AMP BREAKER

PANEL 'D' (CABINET #3, CATHEDRAL ROOM)

MAIN: 200 AMP MAIN LUGS ONLY
BUS: 200 AMPS MINIMUM
SQUARE D OR GE LOAD CENTER OR EQUIVALENT

SLOT #	CKT.	SERVICE	AMPS	BRKR	WIRE	USE	PHS	USE	WIRE	BRKR	AMPS	SERVICE	CKT.	SLOT #
1	D1	CAVERN FEEDER FROM PANEL 'C'	100	THQ	#2 TEK CABLE	2H,N,G	1	2H,N,G	#2 TEK CABLE	THQ	100	CAVERN FEEDER GOING TO PANEL 'E'	D2	2
3		CAVERN FEEDER FROM PANEL 'C'	100	THQ			2			THQ	100	CAVERN FEEDER GOING TO PANEL 'E'		4
5	D5	EMERGENCY LIGHT INVERTER	30	THQ	#10 IN ENT	H,N,G	1	H,N,G	12/3 SOOW	THQ	20	LIGHTING CIRCUIT R5	D6	6
7	D7	RELAY PANEL CONTROL POWER	20	THQ	#12 IN ENT	H,N,G	2			THQ	20	SPARE (INSTALL BREAKER)	D8	8
9	D9	CABINET RECEPTACLE	20	THQ	#12 IN ENT	H,N,G	1			THQ	20	SPARE (INSTALL BREAKER)	D10	10
11	D11	CABINET HEATER HT1	20	THQ	#12 IN ENT	H,N,G	2			THQ	20	SPARE (INSTALL BREAKER)	D12	12
13	D13	EMERGENCY LIGHTING CIRCUIT R3	20	THQ	12/3 SOOW	H,N,G	1			THQ	20	SPARE (INSTALL BREAKER)	D14	14
15	D15	LIGHTING CIRCUIT R1	20	THQ	12/3 SOOW	H,N,G	2			THQ	20	SPARE (INSTALL BREAKER)	D16	16
17	D17	LIGHTING CIRCUIT R2	20	THQ	12/3 SOOW	H,N,G	1			THQ	20	SPARE (INSTALL BREAKER)	D18	18
19	D19	LIGHTING CIRCUIT R4	20	THQ	12/3 SOOW	H,N,G	2			THQ	20	SPARE (INSTALL BREAKER)	D20	20

NOTES:
1. 2H,N,G MEANS RUN TWO HOT, ONE NEUTRAL AND ONE GROUND CONDUCTOR
2. CONDUCTOR SIZING BASED ON COPPER THWN CONDUCTORS.
3. CONTRACTOR MAY USE ONLY ONE 100 AMP CABLE IN ORDER FOR CONDUCTOR TO FIT ON 100 AMP BREAKER

SWITCHING SCHEDULE

SWITCH ID	SHEET #	CONTROLLED RELAY	ACTION	DESCRIPTION
CAVE ENTRANCE				
SW1-CAB4	E1.0	R1-CAB4	TURN ON	AHEAD LIGHTING TURNED ON
		R2-CAB4	TURN ON	AHEAD LIGHTING TURNED ON
		R5-CAB2	TURN ON	TURN ON FIXTURE 'B' BOTTOM OF PIT
SW2-CAB4	E2.0	R1-CAB4	TURN OFF	BEHIND LIGHTING TURNED OFF
		R2-CAB4	TURN OFF	BEHIND LIGHTING TURNED OFF
SW3-CAB4	E2.0	R3-CAB4	TURN ON	AHEAD LIGHTING TURNED ON
		R3-CAB3	TURN ON	AHEAD LIGHTING TURNED ON
		R4-CAB3	TURN ON	AHEAD LIGHTING TURNED ON
SW1-CAB3	E2.0	R1-CAB3	TURN ON	CATHEDRAL ROOM TURNED ON
		R2-CAB3	TURN ON	CATHEDRAL ROOM TURNED ON
		R3-CAB3	TURN ON	CATHEDRAL ROOM TURNED ON
		R4-CAB3	TURN ON	CATHEDRAL ROOM TURNED ON
		R5-CAB3	TURN ON	CATHEDRAL ROOM TURNED ON
SW2-CAB3	E2.0	R1-CAB3	TURN OFF	BEHIND (CATHEDRAL ROOM) TURNED OFF
		R2-CAB3	TURN OFF	BEHIND (CATHEDRAL ROOM) TURNED OFF
		R3-CAB3	TURN OFF	BEHIND (CATHEDRAL ROOM) TURNED OFF
		R4-CAB3	TURN OFF	BEHIND (CATHEDRAL ROOM) TURNED OFF
SW3-CAB3	E2.0	R3-CAB4	TURN OFF	BEHIND LIGHTING TURNED OFF
SW1-CAB2	E2.0	R1-CAB2	TURN ON	AHEAD LIGHTS TURNED ON
		R2-CAB2	TURN ON	AHEAD LIGHTS TURNED ON
		R5-CAB3	TURN ON	AHEAD LIGHTS TURNED ON
SW2-CAB2	E3.0	R2-CAB2	TURN OFF	BEHIND LIGHTS TURNED OFF
		R5-CAB3	TURN OFF	BEHIND LIGHTS TURNED OFF
SW3-CAB2	E3.0	R1-CAB2	TURNS ON	AHEAD LIGHTING TURNED ON
		R3-CAB2	TURNS ON	AHEAD LIGHTING TURNED ON
		R4-CAB2	TURNS ON	AHEAD LIGHTING TURNED ON
SW4-CAB2	E5.0	R1-CAB2	TURNS OFF	BEHIND LIGHTING TURNED OFF
		R3-CAB2	TURNS OFF	BEHIND LIGHTING TURNED OFF
		R4-CAB2	TURNS OFF	BEHIND LIGHTING TURNED OFF
SW12-CAB1	E5.0	R7-CAB1	TURNS ON	AHEAD LIGHTING TURNED ON
		R8-CAB1	TURNS ON	AHEAD LIGHTING TURNED ON
SW11-CAB1	E6.0	R7-CAB1	TURNS OFF/ON	FOOT SWITCH
		R8-CAB1	TURNS OFF/ON	FOOT SWITCH
SW10-CAB1	E6.0	R7-CAB1	TURNS OFF	BEHIND LIGHTING TURNED OFF
		R8-CAB1	TURNS OFF	BEHIND LIGHTING TURNED OFF
SW9-CAB1	E6.0	R3-CAB1	TURNS ON/OFF	PARADISE ROOM RAILING LIGHTING ON
		R5-CAB1	TURNS ON/OFF	AHEAD LIGHTING TURNED ON
		R6-CAB1	TURNS ON/OFF	AHEAD LIGHTING TURNED ON
SW4-CAB1	E7.0	R9-CAB1	TURNS ON/OFF	LIGHTED RAILING FOR STAIR 49
SW8-CAB1	E7.0	R9-CAB1	TURNS ON/OFF	LIGHTED RAILING FOR STAIR 49
SW7-CAB1	E7.0	R2-CAB1	TURNS ON/OFF	PARADISE ROOM PERIMETER LIGHTING
SW6-CAB1	E7.0	R4-CAB1	TURNS ON/OFF	REST OF PARADISE ROOM LIGHTING TURNED ON
SW5-CAB1	E7.0	R5-CAB1	TURNS OFF	BEHIND LIGHTING TURNED OFF
		R6-CAB1	TURNS OFF	BEHIND LIGHTING TURNED OFF
SW3-CAB1	E7.0	R1-CAB1	TURNS ON/OFF	EXIT TUNNEL AND AIR LOCK OCCUPANCY LIGHTS TURNED ON
SW2-CAB1	E8.0	R4-CAB1	TURNS ON/OFF	PARADISE ROOM LIGHTING TURNED OFF
		R2-CAB1	TURNS ON/OFF	PARADISE ROOM LIGHTING TURNED OFF
		R3-CAB1	TURNS ON/OFF	PARADISE ROOM RAILING LIGHTING OFF
SW1-CAB1	E9.0	R1-CAB1	TURNS ON/OFF	EXIT TUNNEL AND AIR LOCK OCCUPANCY LIGHTS TURNED OFF
CAVE EXIT				

THESE SWITCHES WERE INSTALLED DURING PHASE 1 OF THE PROJECT

NOTE: AHEAD MEANS LIGHTS AHEAD WITH RESPECT TO THE DIRECTION OF TRAVEL BY A TOUR GROUP. CONVERSELY, BEHIND MEANS THE LIGHTS BEHIND WITH RESPECT TO THE DIRECTION OF A TOUR GROUP.

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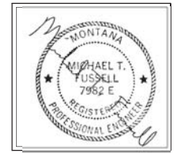

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